George's PINK PAGES October 1999

My Thoughts about Bee Diseases, Mites, and Pests

There are volumes written by hundreds of authors on these subjects and no one has the time or fortitude to read all of them. Hence, to make it simple, at the request of many beekeepers, I will write a simplistic, but explanatory, outline of the diseases, mites, and pests that have to be dealt with in Central Maryland (the Baltimore-Washington DC area).

BACTERIAL DISEASES: American Foulbrood and European Foulbrood. AFB was such a major problem back in World War I days when it was estimated that 1 out of every 3 colonies in the country were infected with this highly infectious disease that the Federal Government initiated our present bee inspection program in 1922 in an attempt to control and stop the spread of AFB. As you know, over the past 20-30 years, most states have eliminated AFB to about 1-2% of the colonies inspected. However, even in 1999, there is NO KNOWN CURE FOR AFB. Further, the only known methods of killing the AFB spore that has infected the wood of a hive body are drastic and difficult: Char the surface of the wood with fire, boil the wood in a solution of lye, irradiate the wood with Cobalt 60 radiation or high energy electrons, or in Maryland, Maine, and North Carolina the wood can be sterilyzed with ethylene oxide gas by our Bee Inspection Department. Note that I did not mention Terramycin, because Terramycin WILL NOT KILL the AFB spore. Terramycin only has the ability to CONTROL the spread of AFB, but once started, its use has to be continued at least once each year, but all honey, wax, frames, bottom boards, hive bodies, and even your clothes, hive tool, and smoker are infected with active AFB spores which, of course, infect any new bees you might buy or obtain. Terramycin ONLY CONTROLS AFB just as a shot of insulin every day can control diabetes in humans, but the human dies of diabetes if the daily insulin shots are stopped.

Personally, I do not believe in the use of Terramycin and have never used it in my 66 years of beekeeping. I want my bees, my honey, and my wooden ware free of disease; and hence, when one of my colonies becomes infected with AFB by coming in contact with a diseased bee or infected feral honey, I recognize the problem quickly, destroy the bees, treat the wooden ware with Maryland's ethylene oxide, and the rest of my apiary remains nice and CLEAN of disease.

I suggest do exactly whatever your bee inspector suggests if either he or you find AFB in one of your colonies, but I hope he does not suggest using Terramycin, particularly if your bees are close to mine.

European Foulbrood can be treated with Terramycin for control and REQUEENING will generally cure EFB because there is NO spore as there is with AFB.

FUNGUS: In recent years, more and more cases of CHALKBROOD DISEASE are seen. This is easily identified when you see hard (chalk like) bodies of brood (pupa) out on the doorstep of the bottom board or see these same hard bodies still in the brood comb. There is no chemotherapeutic agent to treat this disease. It is believed that certain stocks of bees are more prone than other stocks to become infected with chalkbrood disease, and hence requeening with a queen of different stock is indicated.

PROTOZOAN: Nosema disease is by far the most widespread of all adult bee diseases. It has been estimated that has many as 60% of all bee colonies have nosema disease present in the spring. Although nosema will rarely kill a colony, it will dramatically weaken the colony so that the colony does not produce the honey that it would be capable of producing if it were disease free. Nosema is a disease of the GUT and it tends to give the bee "loose bowels", which weakens the bee and shortens its life. Ask yourself: Can you do a GOOD DAY'S WORK when you have loose bowels? Unfortunately, most hobbyist beekeepers are not aware of nosema disease and overlook it resulting in poor honey crops. It is easily treated and inexpensive too. Feed 2 gallons of 2:1 sugar syrup to a colony in October and November with each gallon containing a rounded teaspoon of Fumidil-B dissolved in it. This costs about $2/colony and the bees should be free of nosema until next fall.

PARASITIC MITES: Two mites, the microscopic tracheal mite and the more serious Varroa mite , which were first found in the United States in 1984 and 1987 have become a major problem for all beekeepers. They are found in 49 of our 50 states, in all counties, and have killed over 90% of all the untreated colonies in the country. The biggest problem is that the CORRECT treatment of either of these mites necessitates a totally different management technique, particularly treatment TIME DATES, than what beekeepers are used to or what books written prior to about 1990 state. Hence, many GOOD beekeepers, stubbornly refusing to change management style, have lost 80% or 90% of their total colonies in just one year. In some areas, depending on the nectar source, a beekeeper must make a simple decision, i. e., "Either treat for mites at the time specified and lose some of my honey crop, OR lose my bees!" It just doesn't get any more simple than that! Hence, let me talk about the only proper way to treat for both of these mites. The tracheal mite is invisible to the human eye, and is born and lives in the trachea of the bee. Think of the trachea as your lungs, and then think about a human whose lungs don't work very well because of emphysema disease and he is literally strangling. The mites reproduce in the bee's trachea, and finally just stop the bee from breathing and it dies. The ONLY APPROVED chemical by the government to kill the tracheal mite is menthol. Menthol works and works well, but it MUST BE USED IN WARM WEATHER! Menthol is a solid crystal that sublimes (goes from solid to gas without becoming liquid) at 85 degrees. Hence, in our central Maryland area, menthol MUST BE installed in the brood area about AUGUST 15th, BUT BEFORE SEPTEMBER 1st. If menthol is installed after September 1st, there is little chance of subliming into a gas that the bees can breathe into their trachea to KILL the tracheal mites, and the bees die usually in January leaving lots of honey and the menthol crystals still in the hive. The bag of 50 grams of menthol should be placed on the tops of the frames of the LOWEST brood chamber on August 15th and left there until you remove the bag the following spring. If

you are definitely NOT going to use any honey for HUMAN CONSUMPTION, but keep it just for bee feed, you can install the menthol on August 15th even with supers still on; but removing that honey for human food is just inviting the inspection and punishment to YOU by the Federal or State Government food authorities. Contrary to anything you have heard, menthol works and works well but it has to be present when daytime temperatures will hit 85 degrees for several days after the menthol is installed!
If you don't want to use menthol, you can try the labor intensive use of grease patties scientifically studied by Dr. Diana Sammataro. Grease patties are made of 1 pound of CRISCO mixed with 2 pounds of table sugar and shaped into hamburger size patties, which are placed on top of brood frames and replaced as needed all 12 months of the year, even during a nectar flow. Unlike menthol, grease patties do NOT kill the tracheal mites butjust control their population by confusing the mite as to which bee to select as its host to invade its trachea. This method works provided that you often inspect the brood chamber to see if an old pattie needs replacement ALL 12 MONTHS OF THE YEAR . Don't be a "wise guy" and think you can start using grease patties in late August, replace them once or twice in the fall, make some fall honey and think your bees are going to survive the tracheal mite infestation; because your bees probably will not survive the winter. Since grease patties do not KILL the mites, but just confuse them, the treatment has to be used for many months in advance of winter to lower the mite population to a NON-LETHAL number that allows your bees to live through the winter. But even further, since grease patties do NOT kill tracheal mites, even if your bees make it through the winter, they are "sick" enough from mite infection that they have a difficult time developing into a strong colony that can make you a fine crop of honey. Unless you are just "bent on" getting some of that quick crystallizing goldenrod or aster fall honey, I suggest that you make your honey crop between April and August, install menthol on August 15th which KILLS about 95% of all tracheal mites, and look forward to a strong colony in the spring that can produce another record yield of honey; and forget any other suggestions for tracheal mite curtailment until research scientists can prove the value of something else.

In spite of the fact that the varroa mite is highly visible to humans, it has proven itself the more serious of the two mites primarily because beekeepers just can't seem to follow simple directions, don't bother to treat, treat at the wrong times, or treat with an ineffective material. This is like a hunter hiding in a duck blind but having a lead slug in his gun shells instead of bird shot; or a fisherman with bait, hooks, and sinker for bottom fishing when the fish are up "breaking" on the surface feeding on schools of surface fish. You don't have to inspect your bees to see if they are infected with varroa mites, because almost every colony in the country has Varroa mites. There is little guesswork about the choice of treatment, since Apistan works very effectively in probably over 95% of all the areas of our country and when used at the time designated by research scientists. There are ONLY A FEW spots in the whole country where varroa mites have been found truly resistant of Apistan, and this resistance has generally been caused by beekeeper abuse of written label directions, particularly that one that says "NEVER LEAVE ON MORE THAN 42 DAYS OR ALL WINTER". On three separate occasions, I did sticky board tests for mites "supposedly resistant to Apistan"; and using MY Apistan strips, I proved that the mites were not resistant to Apistan; but the

beekeeper had bought the Apistan strips several years ago and left them laying open in the heat and sunlight of his truck or garage and another beekeeper who was trying to use the strips a second time after washing them. A pamphlet put out by the American Association of Professional Apiculturists clearly describes the whole theory behind the population increase of varroa mites and when to treat a colony to kill these mites in different parts of the country. Briefly, one female mite can lay eggs in one bee cell and either 2 or 3 mites are produced from that one bee cell. Hence, when the bees are quickly building a large bee population in the spring and early summer, the varroa mite population is developing FASTER than the bee population and sooner or later, maybe in August, the colony which just made a record crop of honey before July 4th, suddenly COLLAPSES AND DIES! The fact that the eggs of the mites are layed with a 4 day old bee larva and feeds off the capped bee pupa as its host, sometimes killing or disabling the new bee, it is obvious that the sudden growth of mites increases rapidly with heavy bee brood production. Compared to almost constant queen laying in the warm southern states, there is just a short time of heavy brood production in the cooler northern states. This means that Maine bees can be protected by just one treatment with Apistan, whereas Florida bees may require 3 different treatments. The time of year Apistan treatment is VERY important to gain the best results with the least use of Apistan on the bees. Obviously, the BEST time to use Apistan to KILL varroa mites so they cannot reproduce rapidly is when there is little or no bee brood to serve as host to the mites. In Maryland, queens are normally not laying very much in October and almost nothing in November. Hence, I install Apistan on October 1st and remove it on November 15th; and this treatment during this time of almost no bee brood results in very few varroa mites being present to produce mite brood in the spring and early summer. Hence, I have rarely found any need for any other Apistan treatment except this one annual treatment done in October and early November.

There seems to be a reluctance on the part of many to open a hive in November to remove Apistan strips; and yet many of these same people use division board feeders which certainly require hive opening for refilling. In central Maryland, normally there are quite a few days in November that the temperature gets to 50 degrees or above, and it is certainly easy to dash home, open a 2 or 3 story colony and snatch out 2 or 4 strips of Apistan in less than a minute. UNDER NO CIRCUMSTANCES, DO NOT LEAVE THESE STRIPS IN THE COLONY UNTIL NEXT SPRING. If you do, your name should be well published to all beekeepers that maybe it was YOUR NEGLIGENCE that created mites resistant to Apistan! You use a thermometer to see it you have a fever, you pull your automobile's dipstick to check your crankcase oil, you test your garden soil for acidity with a pH meter to make sure that your vegetables or flowers grow well, and your doctor weighs you to see if you are overweight. Why then, don't you TEST for mites to ascertain just how badly your bees are infected? There are TWO simple tests: the ether roll test and the sticky board test. Although many people, and our bee inspectors, use the Ether roll test because it is done instantly, I don't like it or use it, because it is not accurate enough, it kills several hundred bees, and there is a chance of killing the queen. I make a Sticky Board test on each colony on March 1st and July 1st. I do not bother to test on Oct. 1st , because I am positively going to start Apistan treatment on that date.

What is a Sticky Board Test? Cut a piece of freezer paper to slightly less than the inside bottom board measurements, about 14" x 19" and spray one side of that paper with PAM. Slide it on to the bottom board. Add a screen of 1/8" hardware cloth on top of the sticky surface (elevate the screen bout 1/4" with spacers) to prevent the bees from getting stuck themselves and prevent them from removing mites that have fallen on the paper. Place either 1 or 2 Apistan strips in the active brood area. REMOVE both the Sticky paper and the Apistan strips after just 24 hours and count the mites on the sheet. If the mite count exceeds 100, immediately start an Apistan strip treatment of the colony with NO honey supers on the colony! Test for just 24 hours, not 30 or 48, but 24! If you have done a GOOD six weeks treatment last October and November, your March 1st test might only show 5-10 mites and your July 1st test might only show 40-60 mites, so you don't have do any Apistan treatment in March or July, because you had done a great job in October and November. However, suppose your July 1st test came up with 250 mites, indicating a high infestation; and you want to make some honey from basswood and alfalfa during July and August. Remove all honey supers, install 4 Apistan strips among the brood, leave them there just 7-10 days, remove the strips, and re-install your honey supers. Let me explain: Your normal Apistan treatment of 6 weeks is designed to cover all the mites that might be present during two 21 day bee brood cycles. However, the greatest kill of mites is the first 24 hours the strips are present, and the kill rate diminishes exponentially each day after the installation. Hence, a 7-10 Apistan treatment kills a very large number of adult mites, but does not kill all or any of the mite eggs or larva that are sealed in capped bee cells feeding on bee pupa. However, this emergency treatment, although labor intensive and costing extra Apistan strips, may save your bees from death, and also allow you to make a late honey crop. However, you still MUST make the full 6 week Apistan treatment in October and November and using NEW, FRESH Apistan strips!

I want to end this writing about mites by saying: Both the tracheal and varroa mites are in 49 of our 50 states and will continue to destroy our bees until our research scientists find better ways to destroy them. Until that time, you are very foolish to use any treatment except menthol for the tracheal mite and Apistan for the varroa mite unless our Department of Bee Inspection reports some additional APPROVED treatments.
I do not love my bees like I love my family, my dog, my cat, or my horses; but I do love what these insects can DO for me by pollinating my garden and my ornamentals as well as providing me with that "nectar of the Gods" - honey. Hence, I will try to provide for their health with the same zeal I use to keep my family and pets healthy. I hope that you feel the same way.

PESTS: The Greater Wax Moth, and ???
Often, we hear someone say "wax moths killed my bees last winter". How WRONG they are! Some phase of wax moths, either adult, larva, or egg, are probably in every colony of bees in the country. However, a healthy colony of bees destroys or controls the adults and larvae so that we rarely see either of them. However, the wax moth eggs are always present and will develop into destructive larvae if or when the bee

population becomes so weak that it cannot maintain surveillance over all parts of the colony. Hence, any situation from disease, loss of a queen, starvation, or "what-have-you" that de-populates the colony or weakens it, the here-to-fore latent wax moths appear on the scene and take over feasting on left-behind pupal sacs in the brood frames and tunnel their way through the wax frames getting from one pupal sac to another. Wax moths are only active in warm temperatures and prefer dark closed spaces. Frames of DRAWN COMB can be protected from wax moth damage by being closed up tight with PDB, para-dichloro-benzene and kept from extraction until next spring's use, when they can placed in a colony after just "airing out" for 24-48 hours. These frames of DRAWN COMB are a beekeeper's MOST VALUABLE POSSESSION!

Now let me mention the worst pest of all, which I referred to above as ???. The dictionary defines a PEST as: something or someone that is annoying or troublesome. When a beekeeper removes a center brood frame without first making space by removing frame number 1 or 2, he may "roll" the queen and kill her. When the second story brood frames are filled with brood, but the first story frames are empty, the bees swarm because the beekeeper had not reversed the brood boxes. The bees have made 2 supers of honey, built burr comb under the inner cover and swarm, because the beekeeper did NOT provide enough super space. Those "nice" gentle bees of last year have suddenly become mean and nasty, but the queen "appears to be all right"; but if she is not marked, how do you know whether she is last year's queen? A friend told you that the nectar flow has begun, so you inspect your colony about twice a week when you get home from work and use a smoker to quiet them and wear gloves to prevent stingers in your fingers; and disrupt the bees normal routine for about 24 hours every time you open the lid. It is still chilly on April 15th, so you decide to wait until May to add supers, but your bees swarm on April 25th. You don't like the smell of BEE-GO and you don't have a fume board anyhow, so you remove honey by brushing the bees off of the frames one at a time, and your neighbors call the police about your nasty bees in their neighborhood. ETC, ETC, MORE, MORE! What is the significance of my ??? above, or who is being annoying or troublesome to the bees? It is that large group of so-called beekeepers that have not bothered to upgrade their beeHAVER knowledge to that of a beeKEEPER, or that group who still do not believe that "Bees can no longer be kept like Daddy used to keep bees"! More queens are killed every year by care-less bee handling than are killed by any other predator or pest. More bees die every year from the lack of care or disease treatment by beeHAVERS "too busy" to properly take care of their bees than any other single reason. Back in the days when I started beekeeping in 1933, keeping bees ALIVE was vitally important because they could provide added income to your $5 -$10 per week salary IF you had a job. Maybe their livelihood is no longer important, because we all have too many more important things to do like partying, sport games, vacationing, going to the seashore or the mountains, or breaking in a new computer. Stamp Collecting might be better for us, because things don't have to be done on schedule, there are no diseases to contend with, and the neighbors won't complain or try to "ZONE" my hobby away. But what am going to tell my Montgomery County farmer friends that I no longer have bees to pollinate their crops FREE? Am I going to miss the wonderment of adults and their applause as they watch me work my bees, find and show them the MARKED QUEEN BEE, when I have NO protective clothes on, not even a veil? Am I going to miss taking

one of my observation hives to the schools and explain the importance of honey bee pollination to the stomachs of those kids, and telling them that without bees, they may not have orange juice, blueberry muffins, watermelon, or even ice cream? Lastly, am I the shirker that will give up my "calling" in life of TEACHING RESPONSIBLE BEEKEEPING just because I have not been able to upgrade as many beeHAVERS that need upgrading as I would like, taking the "easy" way out by saying " I quit because a have been disabled by strokes and I am old enough to rest." Hell, NO, I don't want to die as a loser, and there are many beeHAVERS out there that I can help, so get out of my way, because I am going to keep on trying to improve their procedures and learn more for my self by always attending meetings with the scientists, breeders, and truly professional apiculturists.
I TALK TOO MUCH!

George Imirie
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